

***Remarks***

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 28-36 are pending in the application, with claim 28 being the only independent claim. Claims 40-46 are cancelled without prejudice to or disclaimer of the subject matter therein. The amendments to the specification, claims, and abstract are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

***Objection to the Title***

The title of the invention was objected to as not being descriptive. The amendment above changes the title. Accordingly, Applicant respectfully requests that the objection be withdrawn.

***Objection to the Abstract***

The Abstract was objected to for allegedly not indicating that which is new in the art to which the claimed invention pertains. Applicant believes that the Abstract is descriptive of the invention and includes that which is new to the art. Nevertheless, Applicant has amended the Abstract to more closely align with the claimed invention. Applicant therefore respectfully requests that the objection be withdrawn.

***Rejections under 35 U.S.C. § 112***

Claim 30 has been rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention. The amendment to the specification presented above addresses the Examiner's concern regarding the thickness of the adhesive layer.

***Rejections under 35 U.S.C. § 103***

Claims 28, 31, and 32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Published Appl. No. 09-260516 to Sato *et al.* ("JP '516 Publication) in view of U.S. Patent No. 6,208,400 to Kameyama *et al.* ("the '400 patent"). Applicant respectfully traverses the rejection. Independent claim 28 has been amended to recite that the anti-diffusion layer is formed of an alloy of the same anti-diffusion metal of the adhesive layer <sup>was in cl 31</sup> and an adhesive metal. The art relied upon by the Examiner does not disclose these features. The JP '516 publication discloses a buffer layer (8) formed of titanium oxide, tantalum oxide, niobium oxide, strontium titanate, barium titanate, oxidization zircon, oxidization aluminum, bismuth oxide, yttrium oxide, or oxidization hafnium (see paragraph [0045]). The '400 patent discloses an undercoat layer 11a (or 11b) for adhesiveness formed from a metal or alloy of titanium, chromium, molybdenum, tungsten, aluminum, tantalum, or nickel. Neither of these disclose an anti-diffusion layer formed of an alloy of the anti-diffusion metal and an adhesive metal, as claimed.

Dependent claims 29, 30, and 33-36 have been rejected under 35 U.S.C. § 103(a) as being unpatentable on the JP '516 publication and the '400 patent, in further view of the U.S. Patent No. 6,414,975 to Ishihashi *et al.* ("the '975 patent") (claims 29 and 30) or U.S. Patent No. 5,802,686 to Shimada *et al.* (claims 33-36). As noted above, independent claim 28 is allowable over the proposed combination of the JP '416 publication and the '400 patent. The '975 patent and the '686 patent do not provide the missing elements. In particular, the '975 patent discloses that a diffusion barrier layer 14a is made of a high melting point metal or a metal containing a high melting point metal, such as gold, copper, manganese, molybdenum, niobium, nickel, palladium, platinum, tantalum, and titanium. The '975 patent does not disclose forming an anti-diffusion layer from an alloy of an anti-diffusion metal and an adhesive metal. Instead, the '975 patent lists several high-melting point metals that may form the diffusion barrier layer. It does not teach the proposition apparently set forth by the Examiner of making an alloy of an adhesive metal and an anti-diffusion metal. Accordingly, because the above-listed claims depend from claim 28, they are allowable for at least the same reasons thereof.

Applicant therefore respectfully requests that the rejections be withdrawn.

### ***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the

outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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**Version with markings to show changes made**

Marked-up version of the paragraph beginning at page 44, line 13:

The adhesive layer 41 is manufactured by the method of the present invention for manufacturing an electromechanical transducer, and is formed from an alloy containing an anti-diffusion metal. This anti-diffusion metal is selected, for example, from the group consisting of iridium (Ir), palladium (Pd), rhodium (Rh), ruthenium (Ru), and osmium (Os). A characteristic of these metals is that they prevent the movement of metals such as titanium and chromium, which are readily diffused by heat, along the grain boundaries of the crystal grains of the above metals. The main component of the adhesive layer 41 is an alloy of the above-mentioned anti-diffusion metal and the metal that constitutes the bottom electrode. Because platinum is used for the bottom electrode in this embodiment, the adhesive layer is an alloy of platinum and the above-mentioned anti-diffusion metal. However, a small amount of the adhesive metal formed at the outset, such as titanium or chromium, remains at the location of this adhesive layer. Specifically, this adhesive layer 41 is not a layer whose composition stays constant from when it is first formed, and is instead a layer produced as a result of the movement of elements occurring in the course of the heat treatment step. The thickness of the adhesive layer 41 is equal to the combined thickness of the adhesive metal layer applied prior to the heat treatment, [and] the first anti-diffusion metal layer, and the metal that <sup>new or after</sup> constitutes the bottom electrode.

Marked-up version of the Abstract:

Marked-up version of claim 28:

28. An electromechanical transducer comprising:  
a ferroelectric thin film sandwiched between a [an] top electrode and a bottom  
electrode[,];  
[said electromechanical transducer comprising] an adhesive layer formed from an  
alloy containing an anti-diffusion metal, said adhesive layer being [and] formed between  
said bottom electrode and [the] a surface where said transducer is installed; and  
an anti-diffusion layer formed from an alloy containing said anti-diffusion metal  
and an adhesive metal, said anti-diffusion layer being [and] formed between said bottom  
electrode and said ferroelectric thin film.

Marked-up version of claim 31:

31. The electromechanical transducer according to Claim 28, wherein said  
adhesive metal of said anti-diffusion layer is [an alloy of said anti-diffusion metal and an  
adhesive metal that is] either titanium or [chromium] chromium.